

REMARKS

This response is submitted in response to an Office Action mailed on March 31st, 2006, in which the Examiner took the following action: (1) rejected claims 1-2, 4-8, 10-12, 15-16, 21-25, and 28 under 35 U.S.C. §130(a) as being unpatentable over Howell et al. (US 6,107,008) in view of Ederer (US 6,193,922); (2) rejected claims 9 and 26 under 35 U.S.C. §130(a) as being unpatentable over Howell in view of Ederer and further in view of Roberts (US 4,156,538); (3) and rejected claims 1, 2, 13-23, 27, and 29 under 35 U.S.C. §130(a) as being unpatentable over Hanna et al. (US 6574523 B1) in view of Ederer. Applicants respectfully request reconsideration in view of the foregoing amendments and the following remarks.

REJECTIONS UNDER 35 U.S.C. §103(A)

(1) REJECTION OF CLAIMS 1-2, 4-8, 10-12, 15-16, 21-25, AND 28 UNDER 35 U.S.C. §130(A) AS BEING UNPATENTABLE OVER HOWELL IN VIEW OF EDERER, AND REJECTION OF CLAIMS 1, 2, 13-23, 27, AND 29 UNDER 35 U.S.C. §130(A) AS BEING UNPATENTABLE OVER HANNA IN VIEW OF EDERER.

EDERER US 6,193,922

Ederer teaches a method of 3D prototyping using a granulated powder, a resin, and a cutting surface to build up layers of granulated powders. More specifically, Ederer teaches a method that includes depositing such granules in a pattern with the powder for the release agent and the modeling powder, and then applying a resin to the layer, then using the cutting surface to shave off a portion of the top-most layer to provide a uniform surface on which to deposit an additional layer of powder, and repeating this process until the model is built up. Ederer further

teaches running the block under water to activate the powdered release agent so that the areas filled with the release agent powder will start to dissolve, leaving behind the model to be cleaned, sanded, or additionally finished.

HOWELL US 6,107,008

Howell teaches the irradiation of a layer-formed plastic part through the use of a magnetically-steered exposure apparatus. The apparatus is vacuum sealed and has a radiation source inside, and is placed above the part to be irradiated. The apparatus uses an electromagnetic field to steer the radiation emission as a sweeping pattern across the surface of the part.

HANNA US 6,574,523

Hanna et al. teaches a stereo lithography machine to produce layer-formed plastic parts wherein *regions* of the part may have different material properties. According to Hanna, differing *regions* of a part may be treated with radiation using beam profiling to provide differing properties, including layer-wise variation of properties, within the regions.

Claims 1-2 and 4-14

As amended, claim 1 recites a method for changing a property of a layer-formed plastic part comprised of at least one plastic material, the method comprising: providing a first layer of a partially completed layer-formed plastic part, the first layer being formed using at least one of selective laser sintering (SLS) and fused deposition modeling (FDM); providing an electromagnetic radiation source, the electromagnetic radiation source being at least one of an electron beam, an ultraviolet light source, and a radioactive material; positioning the partially completed layer-formed plastic part within a potential exposure range of the electromagnetic radiation source; forming a second layer adjacent the first layer using at least one of selective laser sintering and fused deposition modeling; *determining an exposure of radiation from the electromagnetic radiation source operable to change a second-layer property of the second layer of the layer-formed plastic part from an existing state to an altered state without substantially changing a first-layer property of the first layer*; and exposing the second layer of the layer-formed plastic part to the exposure of radiation to change the second-layer property to the altered state. (emphasis added).

Applicants respectfully submit that the cited references (Howell, Ederer, and Hannah), either singly or in combination, fail to disclose, teach, or fairly suggest the method recited in claim 1. More specifically, the cited references fail to teach or suggest a method that includes forming a second layer adjacent the first layer using at least one of selective laser sintering and fused deposition modeling, *determining an exposure of radiation from the electromagnetic radiation source operable to change a second-layer property of the second layer of the layer-formed plastic part from an existing state to an altered state without substantially changing a first-layer property of the first layer*, and exposing the second layer of the layer-formed plastic part to the exposure of radiation to change the second-layer property to the altered state, as recited in claim 1.

Ederer teaches layer-formed parts, however, there is no teaching or suggestion in Ederer of the desirability of two successive (adjacent) layers having different properties. Howell teaches exposing a component to radiation to change a property of the component, but again, fails to teach or suggest the desirability of two successive (adjacent) layers having different properties. Hannah teaches variation of properties within a plastic part (including layer-wise variation) on a region by region basis, however, there is no teaching or suggestion in Hannah of the desirability of two successive (adjacent) layers having different properties. Thus, the cited references (Howell, Ederer, and Hannah), either singly or in combination, fail to disclose, teach, or fairly suggest the method recited in claim 1, which includes *determining an exposure of radiation from the electromagnetic radiation source operable to change a second-layer property of the second layer of the layer-formed plastic part from an existing state to an altered state without substantially changing a first-layer property of the first layer*, and exposing the second layer of the layer-formed plastic part to the exposure of radiation to change the second-layer property to the altered state.

For the foregoing reasons, claim 1 is allowable over the cited references. Claims 2 and 4-14 depend from claim 1 and are allowable at least due to their dependencies on claim 1 and also due to additional limitations recited in those claims.

Claims 15-16 and 18-29

Similarly, amended claim 15 recites a method for producing a layer-formed plastic part comprised of at least one plastic material, the method comprising: forming a first layer of a layer-formed plastic part; forming a second layer adjacent the first layer; *determining an exposure of radiation from an electromagnetic radiation source operable to change a second-layer property of the second layer from an existing state to an altered state without changing a first-layer property of the first layer*; and exposing the second-layer layer to the exposure of

radiation to change the second-layer property to the altered state *without changing the first-layer property of the first layer*. (emphasis added).

As described more fully above, Applicants respectfully submit that the cited references (Howell, Ederer, and Hannah), either singly or in combination, do not disclose, teach, or fairly suggest the method recited in claim 15. More specifically, the cited references fail to teach or suggest a method that includes forming a second layer adjacent the first layer; *determining an exposure of radiation from an electromagnetic radiation source operable to change a second-layer property of the second layer from an existing state to an altered state without changing a first-layer property of the first layer*; and exposing the second-layer layer to the exposure of radiation to change the second-layer property to the altered state *without changing the first-layer property of the first layer*, as recited in claim 15.

For the foregoing reasons, claim 15 is allowable over the cited references. Claims 16 and 18-29 depend from claim 15 and are allowable at least due to their dependencies on claim 15 and also due to additional limitations recited in those claims.

(2) REJECTED CLAIMS 9 AND 26 UNDER 35 U.S.C. §130(A) AS BEING UNPATENTABLE
OVER HOWELL IN VIEW OF EDERER, AND FURTHER IN VIEW OF ROBERTS

ROBERTS US 4,156,538

Roberts teaches a method of selectively exposing different areas of plastic book covers to radiation in order to have different material properties on the various areas of the cover. Roberts teaches the use of a radiation shield which allows a radiation source to only penetrate the book faces of the cover and the spine (leaving the hinges unexposed and therefore more flexible than the rest of the cover).

Claim 9

Claim 9 depends from claim 1. Applicants respectfully submit that Roberts fails to remedy the above-noted deficiency of Howell and Ederer (and Hannah), and therefore, claim 9 is allowable over the cited references, either singly or in combination. More specifically, Roberts fails to teach or fairly suggest a method that includes forming a second layer adjacent the first layer using at least one of selective laser sintering and fused deposition modeling, *determining an exposure of radiation from the electromagnetic radiation source operable to change a second-layer property of the second layer of the layer-formed plastic part from an existing state to an altered state without substantially changing a first-layer property of the first layer*, and exposing the second layer of the layer-formed plastic part to the exposure of radiation to change the second-layer property to the altered state, as recited in claim 1. Claim 9 is allowable at least due to its dependency on claim 1.

Claim 26

Claim 26 depends from claim 15. As set forth above, Applicants respectfully submit that claim 26 is allowable over the cited references, either singly or in combination, because the cited references fail to teach or fairly suggest a method that includes forming a second layer adjacent the first layer; *determining an exposure of radiation from an electromagnetic radiation source operable to change a second-layer property of the second layer from an existing state to an altered state without changing a first-layer property of the first layer*; and exposing the second-layer layer to the exposure of radiation to change the second-layer property to the altered state *without changing the first-layer property of the first layer*, as recited in claim 15. Claim 26 is allowable at least due to its dependency on claim 15.

CONCLUSION

Applicants respectfully submit pending claims 1, 2, 4-16, and 18-29 are now in condition for allowance. Accordingly, Applicants respectfully request withdrawal of the rejections, allowance, and passage through issuance. If there are any remaining matters that may be handled by telephone conference, the Examiner is invited to contact the undersigned attorney at the telephone number listed below.

Respectfully Submitted,

Dated: Sept. 29, 2006

By: Dee C. Barr

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